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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

PARK, JUNG H

ART UNIT PAPER NUMBER

2661

DATE MAILED: 10/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/899,509

Applicant(s)

KODIALAM ET AL.

Examiner

Jung Park

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7-16 is/are allowed.
- 6) ☒ Claim(s) 1-6 and 17-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Drawings

1. The drawing is objected to because the "Dykstra" in the figure 2, element 206 should be changed to --Dijkstra--.

Abstract Objections

2. The abstract of the disclosure is objected to because applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited.

The abstract is too long.

Correction is required. See MPEP § 608.01(b).

Specification

3. The disclosure is objected to because of the following informalities:

In pg. 12, line 13, "from node $a \in R$ to node $a \in R$ " *should be changed to* -- from node $a \in R$ to node $b \in R$ --.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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5. Claim 4 recites the limitation "the reduced graph" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-6 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ashwood Smith (U.S. 6,738,354, hereinafter "Smith") in view of Goel et al. (U.S. 6,661,797, hereinafter "Goel").

Regarding claims 1 and 18, Smith discloses the method of claim 1 and the apparatus of claim 18. Smith discloses, "the method comprising the steps of: (a) generating a graph (Smith, Figure 1 *where the route data base is initialized at the routers along the path as an initial stage. That is, network topology and links (graph) are established*) for the packet network (col. 3, line 67 *where packets transfer through MPLS packet network*) integrating logical and optical layers (Figure 1, elements 8, 12 & 4a-d *where packet transfers through logical IP over optical layers*) as nodes and links of the graph, wherein each node of the graph accounts for presence or absence of wavelength conversion within the node (col. 4, lines 14-17; col. 1, lines 48-52 *where considering wavelength conversion within one of the XC nodes*)...";

However, Smith lacks what Goel discloses, "... (b) modifying the graph, if necessary, based on the new demand and any previously routed demands (Goel,

Figure 6, elements 51 & 52; *where the graph (nodes and links) is modified by pruning links, which have insufficient bandwidth, and adding connections based on the new setup request 51 and previously created route database*); and

(c) determining a route through the modified graph as the path for the new demand (Figure 6, element 59 *where for the new request, the graph is modified by running shortest algorithm, that is, $G(N, L_N)$ value is changed and a route is determined based on the modified graph (for description of $G(N, L_N)$, see pg. 6, lines 11-13 in the spec)*)."

Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention was made to apply Goel's steps, which are the step of modifying the initial graph and the step of determining a route, into Smith's initially generated graph for the purpose of solving the shortest path by running Dijkstra's algorithm when there is a new demand. A motivation of solving the shortest path is to find optimal route paths for the new demand by adding/eliminating nodes and links in the packet switching networks. For example, OSPF (open shortest path first) is a well known real-world implementation of Dijkstra's algorithm used in internet routing.

Regarding claim 2, Smith discloses, "the invention as recited in claim 1, wherein, for step (a), each node and link of the graph is present in the graph based on a residual capacity of each wavelength of each optical link (Smith, Figure 2, element 28; col. 4, lines 6-7 *where in a WDM, the label assigned to each LSP is the channel (wavelength), so the availability of labels means available capacity*)."

Regarding claim 3, Smith discloses, "the invention as recited in claim 1, wherein step (a) models i) each node based on whether it is a router (Smith, Figure 1, element

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10a), an optical cross-connect (OXC) with wavelength conversion, or an OXC without wavelength conversion (Figure 1, 4a-d; col. 4, lines 14-17 *where considering wavelength conversion within one of the XC nodes*), and ii) each available wavelength of an optical link between nodes in the graph with a corresponding link in the graph (col. 4, lines 58-63).”

Regarding claim 4, Smith lacks what Goel discloses, “the invention as recited in claim 1, wherein step (c) includes the step of computing the path through the reduced graph via a shortest path routing algorithm (Goel, Figure 6, element 58; col. 11, lines 27-28 *where Dijkstra’s algorithm (shortest path algorithm) is used for a new demand*).”

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention was made to add Dijkstra's algorithm for the purpose of solving the single-source shortest path problem for a directed graph with nonnegative edge weights. A motivation of solving the shortest path is to find the optimal route path in the packet switching networks. For example, OSPF (open shortest path first) is a well known real-world implementation of Dijkstra's algorithm used in internet routing.

Regarding claim 5, Smith discloses, “the invention as recited in claim 1, further comprising the step of routing packetized data along the path (Smith, Figure 1, element 12 *where IP packets are inputs for routing along the path*).”

Regarding claim 6, Smith discloses, “the invention as recited in claim 1, wherein, for step (a), at least one of the nodes includes an optical interface, and at least one of the links is an optical link, and the nodes and links are in a wavelength division multiplex

communications network (Smith, Figure 1 *where XC has at least one optical interface; optical links 18a-c; and XCs implement WDM*)."

Regarding claims 17 and 19, Smith discloses, "the invention as recited in claim 1, wherein the method is embodied in a processor of at least one of a route and a router of a packet network server (Smith, Figure 1, elements 10a & 4a-d *where it is inherent that at least one processor is required to process the dynamic routing algorithm along the route path created by the routers*)."

Regarding claim 20, Smith in view of Goel disclose, all the claim limitations as stated above, except for a computer readable device containing instructions.

However, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention was made to use software-based machines. The benefit using computer-readable device is that program can be changed and upgraded and new features are added easily than hardware changes.

Allowable Subject Matter

8. Claims 7-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jung Park whose telephone number is 571-272-8565. The examiner can normally be reached on Mon-Fri during 7:10-4:40.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau Nguyen can be reached on 571-272-3126. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JP

Jung Park
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September 26, 2005



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